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Sister Lab Program Prospective Partner Nuclear Profile: Vietnam

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Sister Lab Program

Prospective Partner Nuclear Profile: Vietnam

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1. Background

Vietnam's nuclear program began in the 1960s with the installation at Dalat of a 250 kW TRIGA Mk-II research reactor under the U.S. Atoms for Peace Program. The reactor was shut down and its core removed only a few years later, and the nuclear research program was suspended until after the end of the civil war in the late 1970s.

The Soviet Union assisted Vietnam in restoring the Dalat reactor to an operational status in 1984, trained a cadre of scientific and technical staff in its operation, and contributed to the development of nuclear science for the medical and agricultural sectors.

In the agricultural area in particular, Vietnamese experts have been very successful in developing mutant strains of rice, and continue to work with the IAEA to yield strains that have a shorter growing period, increased resistance to disease, and other desirable characteristics.¹ Rice has always been the main crop in Vietnam, but technical cooperation with the IAEA and other states has enabled the country to become one of the top rice producers in the world, exporting much of its annual crop to over two dozen countries annually.²

More recently, Vietnam's government has shown increasing interest in developing a civil nuclear program to supplement its fossil fuel and other energy resources. Projections from a variety of open sources, ranging from the IAEA, the U.S. Department of Energy's Energy Information Administration (EIA), the Vietnamese government, energy



Source: University of Texas Library,
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corporations³, and think tanks all predict a massive increase in energy consumption—especially electricity—within Vietnam and the region as a whole.

This growth in consumption will require a corresponding increase in energy production, which in Vietnam is currently satisfied mainly by fossil fuels (coal) and renewable energy (hydropower and biomass); Vietnam has a refining capacity of about 800 barrels/day. Most of its crude oil is exported to generate export income, and is not used to generate electricity.⁴ Although Vietnam is able to meet most of its needs through its own resources, it consumes more electricity than it produces (approximately six billion KWh/a).⁵ Open sources indicate that increasing exports of manufactured goods and a corresponding growth in the industrial sector (16% since 2003)⁶ will lead to a greater energy shortfall beyond the next decade—between 35 and 65 billion KWh/year after 2020.^{7,8} As a signatory to the Kyoto Treaty and other regional environmental accords, and seeking an alternative to its stretched hydroelectric resources, Vietnam is looking for a means to increase energy production while minimizing emissions of greenhouse gases.⁹

2. Technical Capabilities and Facilities

Dalat Research Reactor



Vietnam's only research reactor is located at the Nuclear Research Institute (NRI) in Dalat. The reactor was originally built in the early 1960s as a 250 kW TRIGA Mk-II pool-type research reactor. The reactor was shut down during the country's civil war in the 1960s and 1970s, and the fuel was removed to the United States in April 1975. In 1984 the reactor was restored to operating condition with the assistance of the Soviet Union, which

installed a new core within the existing reactor tank. The restored 500kW reactor utilizes WWR-M2 fuel assemblies enriched to 36%,¹⁰ and has been primarily engaged in radioisotope production for the medical, agricultural, and industrial sectors, and to conduct research in these and environmentally-related areas.¹¹ The age of the reactor and limitations on neutron flux and power level are beginning to restrict its ability to support increasing user demands; current plans by the NRI are to replace the reactor with a new high power research reactor before 2020.¹²

Radiotherapy Centers

Vietnam Agency for Radiation and Nuclear Safety and Control (VARANSAC) officials informed U.S. Department of Energy (DOE) officials that there are currently 13 Co-60 teletherapy units in use throughout Vietnam. Although DOE has little information on these units, it is known that three operate in Hanoi, several are located in Ho Chi Minh City and the remainder spread about the country. Three disused sources are stored in a warehouse in Ho Chi Minh City, in a purportedly secure facility. All of the sources are

old and nearing their end of operational life. As the units were supplied to Vietnam without a source return policy, the country will be required to store them until they are no longer a hazard.¹³

Irradiation Facilities

VARANSAC representatives informed U.S. DOE officials that there are five irradiator facilities in use and one in storage in Vietnam. One of the facilities is located at the Vietnam Institute for Nuclear Science and Technique in Hanoi, and houses a unit that has approximately 25,000 Curies of activity. The facility is used to sterilize medical supplies and irradiate food. The Vietnam Atomic Energy Commission (VAEC), the facility operator, has plans to implement several upgrades to the unit by 2006, which will increase it to 300,000 Curies. At least two irradiators are located in Ho Chi Minh City, one of which had approximately 400,000 Curies in 1999. Little is known of their current status.¹⁴

Waste Repository

Vietnam does not currently operate a national waste repository, nor does it have a location to securely store the Co-60 sources approaching their end of operational life. U.S. DOE experts have recommended a facility be designed and constructed to securely store these sources in the future.¹⁵

Educational Institutions¹⁶

Hanoi National University (HNU) – Department of Nuclear Physics, awards 30 degrees a year to students in nuclear physics.

Hanoi University of Technology (HUT) – Department of Nuclear Engineering and Environmental Physics, awards about 10 degrees per year in engineering.

Dalat University – 10 degrees a year to graduate students in nuclear science.

VAEC – Offers graduate- (Masters degree) and doctoral-level courses in mathematics, programming, physics, and radiation measurement and protection.

NRI – Training Center, supported by IAEA and BARC financial grants, offers radiation safety center, training in radiation protection and nuclear safety, nuclear technology and energy.

INST Joint Training Center on Radiation Protection – equipped by JAERI, offers courses in radiation protection and measurement, as well as instructor training.

EBP Activities – Offers national training in the direction of education and training, legislation, safety analysis, assessment and regulatory supervision for the Dalat RR.

3. Nuclear Power

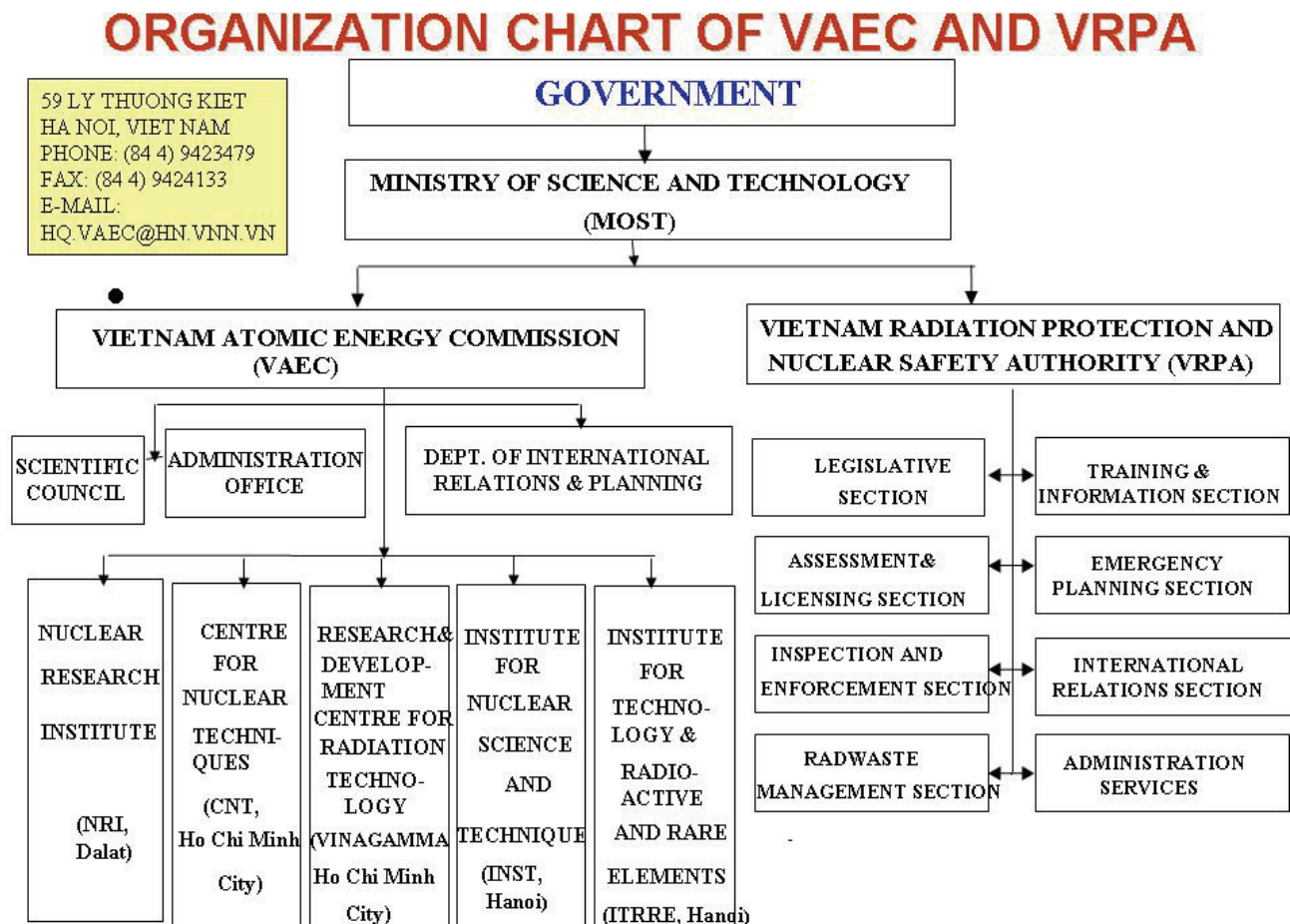
In order to develop the energy infrastructure necessary to continued growth, Vietnam's government is examining the potential contribution of nuclear power to its economy. In addition to signing technical cooperation agreements in nuclear technology with a number of states, it has discussed construction of nuclear power plants with several countries, including Russia,¹⁷ France, the United States, Canada, and Japan.¹⁸ Japan has also offered to train scientific and technical personnel necessary to support operation of the anticipated nuclear power plant;¹⁹ on 25 August 2006, Toshiba Corporation, Hanoi

University of Technology and VAEC signed an agreement for Toshiba to hold annual training at HUT's Department of Nuclear Engineering and Environmental Physics of the Institute of Engineering Physics for 25 graduate and postgraduate students.²⁰

A number of officials from the Vietnam Atomic Energy Institute (VAEI) and the NRI in Dalat have predicted that Vietnam would build its first nuclear power plant between 2010 and 2020 in order to address an anticipated shortfall in electric generating capacity within the same period. The Vice Director of VAEI stated in October 2005 that the plant would possess a 2-4GWe generating capacity, and that a pre-feasibility study was already underway.²¹

4. Nuclear Institutions

Vietnamese nuclear organizations operate within the Ministry of Science and Technology, as shown below. Note that VARANSAC is not represented in this diagram, but also operates under MOST:²²



4.1 Vietnam Atomic Energy Commission (VAEC)

VAEC's main function is to perform research and development in the field of atomic energy. VAEC is headed by a Chairman, currently Dr. Tran Huu Phat; the Vice Chairman is Dr. Bui Van Tuan.²³

4.2 Vietnam Agency for Radiation and Nuclear Safety and Control (VARANSAC)²⁴

VARANSAC is a regulatory body under MOST with the duty of assisting the Minister in the state management of radiation and nuclear safety, and control. The organization is led by a Director General, currently Dr. Ngo Dang Nhan; the Deputy Director General is Dr. Dang Thanh Luong. Beneath the Director General's office are five departments, including the Departments of:

- Technical Assistance for Radiation and Nuclear Safety
- International Cooperation, Legislation and Information
- Inspection, Control and Emergency Response
- Registration and Licensing
- Administration and Planning

VARANSAC's main functions are as follows:²⁵

1. To organize and participate in the formation of legislative documents, code of practice, procedures and regulations for radiation and nuclear safety and control;
2. To participate in the formation of standards on radiation and nuclear safety, specific regulations and policies for those who work directly with radiation;
3. To contribute to and submit policies, development orientations, priorities, programs, annual and 5-year plans on radiation and nuclear safety and control to the Minister; to organize and implement approved plans;
4. To organize and implement the notification, registration, license, renewal, amendment and withdrawal of licenses for radiation and nuclear establishments, radioactive sources, radiation personnel, and works relating to radiation and nuclear issues;
5. To organize the assessment of sites, designs, construction, and justifications for ensuring the radiation and nuclear safety and security of radiation and nuclear establishments;
6. To guide and direct the Local Departments of Science and Technology on radiation and nuclear safety and control; to coordinate with Ministries and Branches to perform the State management on the radiation and nuclear safety and control under the MOST's direction;
7. To conduct regulatory inspections on radiation and nuclear safety according to law;
8. To resolve complaints, denunciations; to deal with violations of regulations on radiation safety and control according to law;
9. To provide State management of radioactive waste;
10. To organize radiation environmental monitoring, to develop emergency response and handling for radiation and nuclear incidents;
11. To control radiation doses and assess the safety of occupational, public and medical exposure;
12. To organize safeguards activities;
13. To establish a record system of data, information on radiation and nuclear safety;

14. To organize research for applying scientific and technological advances in the field of radiation safety and control;
15. To co-organize training course, propaganda and dissemination programs on legislation, radiation and nuclear safety, and safety culture

4.3 Radiation and Nuclear Safety and Controls²⁶

The Ministry of Science and Technology (MOST) oversees the operations of 64 Departments of Science and Technology which are spread throughout the country.

4.3.1 Overview of National Activities

The action plan for the Radiation and Nuclear Safety and Controls is focused on several main tasks, including:

1. Developing and improving the regulatory system
2. Establishing Occupational Exposure Controls
3. Establishing Medical Exposure Controls
4. Establishing the Public Exposure Controls
5. Safe Management of Radioactive Waste; Safety and Security for disused Sources and Radioactive materials
6. Establishing the Emergency Response and Preparedness
7. Developing calibration facilities
8. Manpower development and Public Information
9. License and Inspections for the Dalat Research Reactor

4.3.2 The National Legal Framework Concerning Radiation Protection and Control

1. Basic Atomic Law, Ordinance on Radiation Control
2. Decree 50/1998/ND-CP on Implementation of Ordinance on Radiation Safety and Control
3. Decree 19/2001/ND-CP on Punishment of Violation of Ordinance on Radiation Safety and Control
4. Circulars on radiation protection, management of radioactive waste, transport of radioactive material, fees and fares, and licensing and inspections.

5. Bilateral and Multilateral Nuclear Technical Cooperation

Vietnam has engaged in considerable work both with the IAEA (as indicated below), bilaterally, and on a regional/international basis in developing agricultural, medical and industrial uses for nuclear technology. Below is a chronological summary of projects that are active, complete, or cancelled to date.²⁷ In general, the tables below indicate that Vietnamese scientific and technical personnel have been involved in a very broad range of projects building their expertise and capabilities in many areas utilizing nuclear technology. Without more detail, it is difficult to state the level of expertise of this community, but there appears to be a solid basis for the long term development of a more advanced national nuclear energy sector, as well as expanded programs supporting agriculture, and medicine and industry.

A brief review of national project titles indicates that in addition to the medical and agricultural fields, Vietnam has been involved in a broad range of activities involving nuclear technology, including personnel health and safety, law, reactor operations, materials handling/metallurgy, and education. Its personnel have also upgraded instrumentation and control equipment for its Dalat research reactor and have trained in processing uranium ore.

Within the region, Vietnamese experts have participated in training on nuclear regulatory issues, nuclear health-related issues, radioactive waste management, maintenance of national nuclear institutions, numerous medical and agricultural courses employing nuclear technology, and the operation and maintenance of nuclear research and power facilities and infrastructures.

5.1 National Projects:

Active National Projects (14)

<i>Project Number</i>	<i>Title</i>	<i>Field</i>	<i>1st Year of Approval</i>	<i>Country Officer</i>	<i>Project Responsible Officer</i>	<i>Technical Officer</i>	<i>Total Budget</i>
VIE0008	Human Resource Development and Nuclear Technology Support	0A	1995	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	El Khangi, Fathi (TCAP)	1202262
VIE5014	Rice Mutant Varieties for Saline Land, Phase II	5C	1999	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Shu, Qingyao (NAFA)	731725
VIE6021	Application of Accelerator Technique for Medical Treatment	6C	2001	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Vatnitsky, Stanislav (NAHU) Rosenblatt, Eduardo (NAHU)	351660

VIE8014	Upgrading the Irradiation Facility at Hanoi Irradiation Centre	8H	2001	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Sampa, Maria Helena de O. (NAPC)	34300
VIE8016	Isotope and Nuclear Techniques for Better Management of Groundwater	8M	2001	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Kulkarni, Kshitij Mahadev (NAPC)	283370
VIE9008	Establishment of a National Radiation Safety Training Centre	9X	2001	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Sadagopan, Geetha (NSRW)	154666
VIE0010	Technical Support for Training in Nuclear Engineering at the Hanoi University of Technology	0I	2003	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Einav, Isaac (NAPC) Glockler, Oszvald (NENP)	213840
VIE0011	Human Resource Development and Nuclear Technology Support	0A	2003	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	820570
VIE4014	Modification of the Dalat Reactor Control System	4B	2003	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Paranjpe, Shrinivas Krishnarao (NAPC) Ciuculescu, Cristina (NSNI)	243220
VIE5015	Enhancement of Quality and Yield of Rice Mutants Using Nuclear and Related Techniques, Phase II	5C	2005	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Shu, Qingyao (NAFA) Lagoda, Pierre Jean Laurent (NAFA)	456692
VIE6023	Establishment of National Cyclotron Facilities and Centres for Medical and Research	6B	2005	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Izewska, Joanna (NAHU) Haji-Saeid, Seyed Mohammad (NAPC) Bokulic, Tomislav (NAHU)	310620
VIE8017	Upgrading the Irradiation Facility at Hanoi Irradiation Centre	8H	2005	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Sampa, Maria Helena de O. (NAPC) Haji-Saeid, Seyed Mohammad (NAPC)	408950
VIE8018	Applying Electron Beam Technology for Processing Biomaterials	8H	2005	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Sampa, Maria Helena de O. (NAPC)	352650
VIE9009	Formulation of Atomic Law	9C 0D	2005	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Philip, George (NS)	88410

Completed National Projects (77)

Project Number	Title	Field	Completed on	Country Officer	Project Responsible Officer	Technical Officer	Total Budget
VIE1002	Radiation Dosimetry	1K	1979-11-19	Sarac, Abbas Ilhan (SGOB)			3558
VIE5007	Food Preservation	5H	1979-11-19	Sarac, Abbas Ilhan (SGOB)			24480
VIE6007	Radioisotopes in Medicine	6B	1979-11-19	Sarac, Abbas Ilhan (SGOB)			2225
VIE6008	Radioisotopes in Medicine	6B	1979-11-19	Sarac, Abbas Ilhan (SGOB)			0
VIE9002	Personnel Monitoring	6F 9C	1979-11-19	Sarac, Abbas Ilhan (SGOB)			0
VIE2002	Trace Elements Analysis	2C	1981-08-21	Sarac, Abbas Ilhan (SGOB)		Dolnicar, Joze (NAPC)	26753
VIE6009	Radioisotopes in Medicine	6B	1982-11-23	Sarac, Abbas Ilhan (SGOB)		Vavrejn, Bohuslav (RILS)	36168
VIE5009	Food Irradiation	5H	1983-01-07	Sarac, Abbas Ilhan (SGOB)		Loaharanu, Paisan (NAFA)	4868
VIE1003	Nuclear Physics	1D	1983-07-12	Sarac, Abbas Ilhan (SGOB)		Dolnicar, Joze (NAPC)	68818
VIE1006	Nuclear Physics (Hanoi University)	1D 1L	1983-07-12	Sarac, Abbas Ilhan (SGOB)		Dolnicar, Joze (NAPC)	34047
VIE4002	Nuclear Electronics Laboratory	4G	1983-08-22	Sarac, Abbas Ilhan (SGOB)		Dolnicar, Joze (NAPC)	88303
VIE6010	Nuclear Medicine	6B	1983-08-22	Sarac, Abbas Ilhan (SGOB)		Vavrejn, Bohuslav (RILS)	61676
VIE1004	Nuclear Physics Teaching	1D	1983-09-13	Sarac, Abbas Ilhan (SGOB)		Dolnicar, Joze (NAPC)	114131
VIE4004	Nuclear Fuel for Research Reactor	4B	1984-09-17	Sarac, Abbas Ilhan (SGOB)		Dolnicar, Joze (NAPC)	550658
VIE9003	Radiation Monitoring	9K 9C	1984-10-19	Sarac, Abbas Ilhan (SGOB)		Dolnicar, Joze (NAPC)	117950
VIE5008	Plant Mutation Breeding	5C	1985-10-16	Bautista, Eumelia R.B. (SGCP)		Maluszynski, Miroslav (NAFA)	157648
VIE5010	Isotope Techniques in Soil-Plant Studies	5B	1985-10-16	Bautista, Eumelia R.B. (SGCP)		Lamm, Carl Goeran (NAFA)	3062

VIE8002	Nuclear Techniques in Metallurgy	8E 1G	1985-10-16	Bautista, Eumelia R.B. (SGCP)	Dolnicar, Joze (NAPC)	137298
VIE4005	Nuclear Manpower Development	0B	1986-11-10	Bautista, Eumelia R.B. (SGCP)	Calori, Fausto (NENP)	7008
VIE0003	Nuclear Information Centre	0F 0J	1989-09-25	Bautista, Eumelia R.B. (SGCP)	Taoka, Wesley M. (NESI)	32416
VIE1005	Nuclear Physics (Dalat University)	1D 1L	1989-09-25	Bautista, Eumelia R.B. (SGCP)	Dolnicar, Joze (NAPC)	44107
VIE1007	Experimental Nuclear Physics	1D 1L	1989-09-25	Bautista, Eumelia R.B. (SGCP)	Dolnicar, Joze (NAPC)	14185
VIE2003	Radiation Polymerization	2D	1989-09-25	Bautista, Eumelia R.B. (SGCP)	Markovic, Vitomir M. (NAPC)	22047
VIE6013	Nuclear Medicine (Dalat)	6B	1989-09-25	Aslam, Javed (TCPA)	Ganatra, Ramanik D. (NAHU)	3876
VIE0004	Preparatory Studies for a Nuclear Power Project	0A	1989-09-28	Aslam, Javed (TCPA)	Molina, Pablo (NENP) Calori, Fausto (NENP)	23027
VIE6011	Radioisotopes in Medicine	6G	1989-09-28	Bautista, Eumelia R.B. (SGCP)	Ganatra, Ramanik D. (NAHU)	61531
VIE4006	Computer Centre for Reactor Physics	1F 4D	1990-12-28	Aslam, Javed (TCPA)	Muranaka, Richard George G. (NAPC)	39832
VIE9005	Underwater Inspection of Dalat Nuclear Research Reactor	9F	1990-12-28	Aslam, Javed (TCPA)	Bernatowicz, Marek Edmund (NENS)	33374
VIE6012	Nuclear Medicine (Hue)	6B	1991-01-15	Aslam, Javed (TCPA)	Gopinathan Nair, Gopalan (NAHU) Piyasena, Rienzil Dodwell (NAHU)	84918
VIE4003	Nuclear Instrumentation	4G	1991-12-31	Aslam, Javed (TCPA)	Dolnicar, Joze (NAPC)	153336
VIE4007	Nuclear Instrumentation and Microcomputer Applications	4G	1991-12-31	Aslam, Javed (TCPA)	Dolnicar, Joze (NAPC)	64012
VIE4008	Nuclear Track Detectors	4G	1991-12-31	Aslam, Javed (TCPA)	Ahmed, Jasim Uddin (NENS)	76538
VIE6016	TECHNETIUM-99m PRODUCTION AND QUALITY CONTROL	6G 2F	1991-12-31	Aslam, Javed (TCPA)	Vera Ruiz, Hernan Guido (NAPC)	73986

VIE0002	Nuclear Institute Development	0H	1992-12-30	Aslam, Javed (TCPA)	Akhtar, Khalid Mahmud (NAPC) Ahmed, Jasim Uddin (NENS) Vera Ruiz, Hernan Guido (NAPC)	927778
VIE0005	Nuclear Information Centre	0F 0J	1992-12-30	Aslam, Javed (TCPA)	Taoka, Wesley M. (NESI)	20538
VIE5011	Isotope Techniques in Soil Plant Studies	5B	1992-12-30	Aslam, Javed (TCPA)	Kumarasinghe, Kumarasinghe Saliya (NAFA)	290288
VIE6015	Nuclear Medicine (Lam Dong Hospital)	6B	1992-12-30	Aslam, Javed (TCPA)	Gopinathan Nair, Gopalan (NAHU)	58342
VIE8005	Non-Destructive Testing	8C	1992-12-30	Aslam, Javed (TCPA)	Zatolokine, Boris Vasilyevich (NAPC)	168228
VIE8006	Non-Destructive Testing	8C	1992-12-30	Aslam, Javed (TCPA)	Zatolokine, Boris Vasilyevich (NAPC)	109993
VIE8003	Isotope Hydrology	8M 8G	1993-08-26	Nemoto, Shinichiro Shane (TCPM)	Louvat, Didier (NSRW)	243314
VIE5012	Animal Science	5E 5F	1993-10-13	Nemoto, Shinichiro Shane (TCPM)	Perera, Buthgamu Mudiyansele Amithral Oswin (NAFA)	178036
VIE9006	Radiation Exposure Assessment	9K	1993-10-13	Nemoto, Shinichiro Shane (TCPM)	Weiss, Bernard H. (NSNS)	11896
VIE0007	Workshop on Design, Management and Evaluation of TC Projects	0A	1993-10-18	Nemoto, Shinichiro Shane (TCPM)	Markovic, Vitomir M. (NAPC)	21080
VIE8004	Food Irradiation	8I 5H	1993-10-18	Nemoto, Shinichiro Shane (TCPM)	Ahmed, Mainuddin (NAFA)	1360944
VIE1008	Nuclear Analytical Services	1L 2C	1994-01-28	Nemoto, Shinichiro Shane (TCPM)	Akhtar, Khalid Mahmud (NAPC)	72685
VIE4009	Design and Production of Nuclear Instruments	4G	1994-05-25	Nemoto, Shinichiro Shane (TCPM)	Walsh, Robin L. (NAPC)	145095
VIE4011	Service Facilities for Radiation Detectors	4G	1995-08-02	Yang, Maeng-Ho (TCPM)	Kaufmann, Herbert (NAPC)	140316

VIE4012	Nuclear Instrumentation Services	4G	1995-08-02	Yang, Maeng-Ho (TCPM)		Kaufmann, Herbert (NAPC)	87603
VIE6017	Development of Nuclear Medicine in South Vietnam	6B	1995-08-02	Yang, Maeng-Ho (TCPM)		Yamasaki, Toshiro (NAHU)	178213
VIE3003	Uranium Ore Processing Laboratory	3F	1995-11-30	Yang, Maeng-Ho (TCPM)		Nicolet, Jean-Paul (NEFW)	134502
VIE7002	Analysis of Environmental Samples	7J	1995-11-30	Yang, Maeng-Ho (TCPM)		Stone, Susan F. (NAHU)	100004
VIE3002	Nuclear Analytical Techniques for Prospection	3E 8E	1995-12-14	Yang, Maeng-Ho (TCPM)		Lewkowicz, Irene (NAPC)	282647
VIE0006	Manpower Development	0A	1995-12-22	Yang, Maeng-Ho (TCPM)			202935
VIE4010	Renovation of the Dalat Reactor Control System	4G	1995-12-22	Yang, Maeng-Ho (TCPM)		Akhtar, Khalid Mahmud (NAPC)	352083
VIE9004	Radiation Protection Development	9C	1995-12-22	Yang, Maeng-Ho (TCPM)		Skornik, Karol (TCAF) Matscheko, Georg (NAHU)	505606
VIE6018	Upgrading Brachytherapy Services - Ho Chi Minh City	6C	1996-12-23	Kamel, Reyad Sherif (TCAP)		Levin, Victor Cecil (NA)	206240
VIE7003	Haematological Laboratory for Radiation Injury	7C	1996-12-23	Kamel, Reyad Sherif (TCAP)		Mircheva, Jordanka (NAHU)	93338
VIE4013	Local Production of Nuclear Medical Instruments	4G	1997-04-30	Kamel, Reyad Sherif (TCAP)		Kaufmann, Herbert (NAPC)	120440
VIE8009	NDT for Industrial & Engineering Non-Metallic Products	8C	1997-04-30	Kamel, Reyad Sherif (TCAP)		Dobrowolski, Marek Krzysztof (NAPC)	182261
VIE8007	Establishment of Sedimentology Laboratory	8N	1998-02-27	Kamel, Reyad Sherif (TCAP)		García Agudo, Edmundo (NAPC)	196914
VIE8011	Study of Sedimentation Rates Using Cs-137 and Pb-210	8N	1998-05-25	Kamel, Reyad Sherif (TCAP)		García Agudo, Edmundo (NAPC)	109521
VIE8008	Nuclear Techniques for Groundwater Pollution Protection	8M	1998-08-28	Kamel, Reyad Sherif (TCAP)		Groening, Manfred (NAPC)	202614
VIE6019	QA and QC Programme for Hospital Radiation Facilities	6C 0Q	2000-08-30	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Turai, Istvan (NSRW) Ortiz Lopez, Pedro (NSRW)	171977
VIE7004	Establishment of a Tissue Bank	7E	2000-08-30	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Tatsuzaki, Hideo (NAHU)	128057

VIE5013	Improvement of Basic Food Crops Through Induced Mutation	5C	2000-10-31	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Nichterlein, Karin (NAFA)	291073
VIE0009	Pre-Feasibility Study for the Introduction of Nuclear Power	0E	2000-11-29	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Hamilton, Bruce (NE)	147129
VIE3004	Rare Earth Extraction Technology	3D 3F 8E	2000-11-29	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Rossbach, Matthias H. (NAPC)	197218
VIE8010	Radiation Sterilization of Health Care Products	8H	2001-12-20	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Gueven, Olgun (NAPC)	528620
VIE9007	Infrastructure for Treatment & Management of Radwaste	9E 4O	2001-12-20	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Al-Mughrabi, Mohamed (NEFW) Wieland, Patricia (NS)	207751
VIE2006	Nuclear Analysis of Food and Environmental Samples	2C	2003-02-26	Kamel, Reyad Sherif (TCAP)	Rossbach, Matthias H. (NAPC)	Rossbach, Matthias H. (NAPC)	269929
VIE6020	Strengthening Nuclear Medicine Services	6B	2003-03-28	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Padhy, Ajit Kumar (NAHU)	452814
VIE8015	Strengthening the Capability of Radiotracers for Enhancing Oil Recovery	8J	2003-05-30	Kamel, Reyad Sherif (TCAP)	Thereska, Jovan (NAPC)	Thereska, Jovan (NAPC)	173415
VIE2005	Automation and QA-QC in Neutron Activation Analysis	2C	2004-08-27	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Rossbach, Matthias H. (NAPC)	180989
VIE2007	QA/QC of Mineral and Environmental Sample Measurements Using Nuclear Analytical Techniques	2C	2004-08-27	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Rossbach, Matthias H. (NAPC)	174223
VIE6022	Upgrading Nuclear Medicine Services	6B	2005-12-28	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Dondi, Maurizio (NAHU)	162237
VIE8012	Ground Water and Nutrient Management	8A	2005-12-28	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Groening, Manfred (NAPC)	225664
VIE8013	Advanced NDT Methods for the Construction Industry	8C	2005-12-28	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Einav, Isaac (NAPC)	176905

Cancelled National Projects (2)

<i>Project Number</i>	<i>Title</i>	<i>Field</i>	<i>Cancelled On</i>	<i>Country Officer</i>	<i>Project Responsible Officer</i>	<i>Technical Officer</i>	<i>Total Budget</i>
VIE6014	Nuclear Medicine Facilities	6B	1988-10-19	Aslam, Javed (TCPA)		Ganatra, Ramanik D. (NAHU)	0

VIE2004	Nuclear Analytical Laboratory	2C	1991-10-15	Aslam, Javed (TCPA)		Zatolokine, Boris Vasilyevich (NAPC)	0
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5.2 Regional/Interregional Projects:

Active Regional/Interregional Projects (66)

<i>Project Number</i>	<i>Title</i>	<i>Field</i>	<i>1st Year of Approval</i>	<i>Country Officer</i>	<i>Project Responsible Officer</i>	<i>Technical Officer</i>	<i>Total Budget</i>
INT0060	Technical Co-operation Between Developing Countries	0A	1995	Salema, Manase Peter (TCAP)		Salema, Manase Peter (TCAP)	946144
INT4131	Sustainable Technologies for Managing Radioactive Wastes	3H	1997	Kurghinyan, Vladimir (TCEU)	Kurghinyan, Vladimir (TCEU)	Al-Mughrabi, Mohamed (NEFW) Balla, Janos (NEFW) Kahraman, Alper (NEFW)	2565864
RAS6029	Distance-assisted Training for Nuclear Medicine Technicians (RCA)	6B	1997	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Dondi, Maurizio (NAHU) Watanabe, Naoyuki (NAHU)	636688
INT5145	Insect Pest Control Using the Sterile Insect Technique	5D	1999	Salema, Manase Peter (TCAP)		Hendrichs, Jorge Pedro (NAFA)	1936300
RAS5035	Improving Animal Productivity and Reproductive Efficiency (RCA)	5E	1999	Dias, Mahendra Prinath (TCAP)		Boettcher, Paul John (NAFA) Vercoe, Philip Edward (NAFA)	1052981
RAS6033	Distance Education in Radiation Oncology (RCA)	6C	1999	Dias, Mahendra Prinath (TCAP)		Hendry, Jolyon Hindson (NAHU)	715200
RAS8084	Isotope Use in Managing and Protecting Drinking Water (RCA)	8M	1999	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Kulkarni, Kshitij Mahadev (NAPC)	589625
RAS9023	Legislation for Safe and Peaceful Nuclear Applications	0D 9C	1999	Lutfi, Nabil (TCAP)	Lutfi, Nabil (TCAP)	Vez Carmona, Maria de Lourdes (EXPO) Djermouni, Belkacem (NSRW)	327847

RAS9024	Environmental Radiation Monitoring and Regional Database (RCA)	9G	1999	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Telleria, Diego Miguel (NSRW) Shakhashiro, Abdulghani (NAAL)	138708
INT0074	Pre-Project Assistance (Africa and East Asia and the Pacific)	0A	2001	Salema, Manase Peter (TCAP)	Salema, Manase Peter (TCAP)	Salema, Manase Peter (TCAP)	539136
INT0076	Country Programme Review (Africa and East Asia and the Pacific)	0A	2001	Salema, Manase Peter (TCAP)	Salema, Manase Peter (TCAP)	Salema, Manase Peter (TCAP)	109200
INT0078	ICT-Assisted Training/Learning Materials in Nuclear Instrumentation Maintenance	0I	2001	Maksoudi, Mokdad (TCAF)	Maksoudi, Mokdad (TCAF)	Markowicz, Andrzej (NAAL) Kaufmann, Herbert (NAPC)	357650
RAS0032	Support Towards Self-Reliance and Sustainability of National Nuclear Institutions	0A	2001	Lutfi, Nabil (TCAP)	Lutfi, Nabil (TCAP)	Dias, Mahendra Prinath (TCAP) Lutfi, Nabil (TCAP)	660166
RAS4021	Management of Changes for Competitive Nuclear Power Performance	4C	2001	Xu, Naicheng (TCAP)	Xu, Naicheng (TCAP)	Mazour, Thomas Joseph (NENP) Kang, Ki-Sig Sig (NENP) Zapata, Felipe (NAFA)	1036304
RAS5039	Restoration of Soil Fertility and Sustenance of Agricultural Productivity (RCA)	5B	2001	Dias, Mahendra Prinath (TCAP)			619203
RAS5040	Enhancement of Genetic Diversity in Food, Pulses, and Oil Crops and Establishment of Mutant Germplasm Network (RCA)	5C	2001	Dias, Mahendra Prinath (TCAP) Kim, Myung Ro (TCAP)		Shu, Qingyao (NAFA) Lokko, Yvonne Rosaline Naa (NAFA) Lagoda, Pierre Jean Laurent (NAFA)	607540
RAS5041	Production of Foot and Mouth Disease Antigen and Antibody ELISA Reagent Kit (RCA)	5F	2001	Dias, Mahendra Prinath (TCAP)		Crowther, John Richard (NAFA)	191210
RAS5042	Application of Food Irradiation for Food Security, Safety, and Trade (RCA)	5H	2001	Dias, Mahendra Prinath (TCAP)		Rubio Cabello, Wilma Tatiana (NAFA)	226263
RAS6034	Quality Assurance Programme for Molecular-Based Diagnosis of Infectious Diseases	6B	2001	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Khan, Baldip Kaur (NAHU)	863110
RAS8091	Process Diagnostics and Optimization in Petrochemical Industry (RCA)	8J	2001	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Jin, Joon-Ha (NAPC) Einav, Isaac (NAPC)	723375
RAS8092	Investigating Environment and Water Resources in Geothermal Areas (RCA)	8M	2001	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Kulkarni, Kshitij Mahadev (NAPC)	287826

RAS8093	Use of Isotopes in Dam Safety and Dam Sustainability (RCA)	8N	2001	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Araguas Araguas, Luis Jesus (NAPC) Kurtas, Tuerker (NAPC)	307631
RAS9025	Strengthening Management of Operational Safety at NPPs	9N	2001	Xu, Naicheng (TCAP)	Xu, Naicheng (TCAP)	Nichols, Robert Charles (NSNI)	717295
RAS9026	National Regulatory Control and Occupational Radiation Protection Programmes	9C	2001	Dey, Sujit (TCAP)	Dey, Sujit (TCAP)	Mrabit, Khammar (NSRW) O'Donnell Torroba, Patricio Alfonso (NSRW)	1719895
RAS9027	Development of Technical Capabilities for Sustainable Radiation and Waste Safety Infrastructure	9E 9C	2001	Dey, Sujit (TCAP)	Dey, Sujit (TCAP)	Mrabit, Khammar (NSRW) O'Donnell Torroba, Patricio Alfonso (NSRW)	2277735
INT6052	Improving the Quality of Production and Uses of Radiation Sterilized Tissue Grafts	6B	2002	Salema, Manase Peter (TCAP)		Hendry, Jolyon Hindson (NAHU)	844860
INT4141	Status and Prospects of Development for and Applications of Innovative Reactor Concepts for Developing Countries	4C	2003	Cardoso Cabezon, Alain Jorge (TCEU)	Cardoso Cabezon, Alain Jorge (TCEU)	Kuznetsov, Vladimir (NENP)	883991
INT5147	Developing Salt-tolerant Crops for Sustainable Food and Feed Production in Saline Lands	5C	2003	Salema, Manase Peter (TCAP)	Salema, Manase Peter (TCAP)	Spencer, Marie Madeleine (NAFA) Miranda, Manoela Pessoa de (NAFA) Lagoda, Pierre Jean Laurent (NAFA)	336300
INT5148	Establishing Quality Systems in Veterinary Testing Laboratories	5E	2003	Salema, Manase Peter (TCAP)		Viljoen, Gerrit Johannes (NAFA) Crowther, John Richard (NAFA)	229580
RAS0035	Management of Technical Cooperation among Developing Countries (RCA)	0A	2003	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	997867
RAS0036	Country and Regional Programme Review	0A	2003	Salema, Manase Peter (TCAP)	Salema, Manase Peter (TCAP)	Salema, Manase Peter (TCAP)	481900

RAS0037	Support to Member States on Design and Formulation of Project Proposals	0A	2003	Salema, Manase Peter (TCAP)	Salema, Manase Peter (TCAP)	Salema, Manase Peter (TCAP)	293667
RAS0038	Role of Nuclear Power and Other Energy Options in Competitive Electricity Markets (RCA)	0E	2003	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Jalal, Ahmed Irej (NE)	228735
RAS4022	Improvement of Research Reactor Operation and Utilization, Phase II (RCA)	4B	2003	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Paranjpe, Shrinivas Krishnarao (NAPC)	209975
RAS4023	Repair and Refurbishment of Nuclear Instruments, Phase II	4G	2003	Lutfi, Nabil (TCAP)	Lutfi, Nabil (TCAP)	Kaufmann, Herbert (NAPC)	316670
RAS6036	Management of Liver Cancer Using Transarterial Radioconjugate Therapy (RCA)	6B	2003	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Dondi, Maurizio (NAHU) Watanabe, Naoyuki (NAHU)	217210
RAS6037	Quality Assurance for Treatment of Cervix Cancer by Radiotherapy (RCA)	6C	2003	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Rosenblatt, Eduardo (NAHU)	212000
RAS6038	Strengthening Medical Physics through Education and Training (RCA)	6F	2003	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	McLean, Ian Donald (NAHU)	477264
RAS6039	Use of Radiosynovectomy in the Management of Patients Suffering from Painful Joint Disorders (RCA)	6B	2003	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Dondi, Maurizio (NAHU) Watanabe, Naoyuki (NAHU)	169463
RAS7011	Enhancing the Sustainability of the Marine Coastal Environment (RCA)	7F	2003	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Zaknun, John (NAHU) Boisson, Florence (NAML) Jeffree, Ross A. (NAML)	305888
RAS7013	Improved Information about Urban Air Quality Management (RCA)	7L	2003	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Trinidad, Trinidad Palad (NAHU) Markowicz, Andrzej (NAAL)	810946
RAS7014	Monitoring of Food Fortification Programmes Using Nuclear Techniques	6J	2003	Sukasam, Kesrat (TCAP)	Sukasam, Kesrat (TCAP)	Lagoda, Pierre Jean Laurent (NAFA) Trinidad, Trinidad Palad (NAHU)	918284
RAS8094	Optimization of Materials in Industry Using Online Bulk Analysis Techniques (RCA)	8A	2003	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Jin, Joon-Ha (NAPC)	327934

RAS8095	Improving Regional Capacity for Assessment, Planning, and Response to Aquatic Environmental Emergencies (RCA)	8G	2003	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Scholten, Jan Christoph (NAML)	370400
RAS8096	Modification of Natural Polymers through Radiation Processing (RCA)	8H	2003	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Sampa, Maria Helena de O. (NAPC)	125911
RAS8097	Isotope Techniques for Groundwater Contamination Studies in Urbanized and Industrial Areas (RCA)	8M	2003	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Kulkarni, Kshitij Mahadev (NAPC)	462337
RAS9028	Development of an Asian Nuclear Safety Network	9A	2003	Lutfi, Nabil (TCAP)	Lutfi, Nabil (TCAP)	Lederman, Luis (NS)	219490
RAS9029	Harmonization of Radiation Protection, Phase IV (RCA)	9C	2003	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	O'Donnell Torroba, Patricio Alfonso (NSRW) Mrabit, Khammar (NSRW)	779884
INT5149	Training Course on the Use of the Sterile Insect and Related Techniques	5D	2005	Boussaha, Ali (TCAF)	Boussaha, Ali (TCAF)	Hendrichs, Jorge Pedro (NAFA)	225000
RAS0041	Tracing Future Sustainable Paths through Nuclear and Other Energy Options (RCA)	0E	2005	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Jalal, Ahmed Irej (NE)	274590
RAS4024	Radioisotope Production and Neutron Beam Applications (RCA)	4B	2005	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Paranjpe, Shrinivas Krishnarao (NAPC) Pillai, Maroor Raghavan Ambikalmajan (NAPC) Fulajtar, Emil (NAFA)	335763
RAS5043	Sustainable Land Use and Management Strategies for Controlling Soil Erosion and Improving Soil and Water Quality (RCA)	5B	2005	Dias, Mahendra Prinath (TCAP) Kim, Myung Ro (TCAP)			227440
RAS5044	Integrated Approach for Improving Livestock Production Using Indigenous Resources and Conserving the Environment (RCA)	5E	2005	Dias, Mahendra Prinath (TCAP) Kim, Myung Ro (TCAP)		Boettcher, Paul John (NAFA) Vercoe, Philip Edward (NAFA)	441200
RAS6040	Improvement in Quality of Radiotherapy for Frequent Cancers in the Region (RCA)	6C	2005	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Rosenblatt, Eduardo (NAHU) McLean, Ian Donald (NAHU)	893346
RAS6041	Preventing Osteoporosis and Promoting Bone Mass in Asian Populations Using a Food-based Approach (RCA)	6J	2005	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Davidsson, Lena Margareta (NAHU)	398180

RAS6042	Tumour Imaging Using Radioisotopes (RCA)	6B	2005	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Watanabe, Naoyuki (NAHU)	400020
RAS6043	Regional Screening Network for Neonatal Hypothyroidism, Phase II	6B	2005	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Solanki, Kishor K. (NAHU)	409070
RAS8098	Radiation Technology for Development of Advanced Materials and for Protection of Health and the Environment (RCA)	8J	2005	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Sampa, Maria Helena de O. (NAPC)	275560
RAS8099	Radioisotope Technology for Natural Resource Exploration and Exploitation (RCA)	8J	2005	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Jin, Joon-Ha (NAPC)	323350
RAS8100	Advanced Industrial Radiography (RCA)	8P	2005	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Einav, Isaac (NAPC)	243530
RAS9033	Developing Technical Capabilities for the Protection of Health and Safety of Workers Exposed to Ionizing Radiation	9I 9C 9J	2005	Dey, Sujit (TCAP)	Dey, Sujit (TCAP)	Deboodt, Pascal P. A. (NSRW) O'Donnell Torroba, Patricio Alfonso (NSRW) Mrabit, Khammar (NSRW)	197650
RAS9034	Strengthening Radiological Protection of Patients and Medical Exposure Control	9J	2005	Dey, Sujit (TCAP)	Dey, Sujit (TCAP)	Rehani, Madan Mohan (NSRW) O'Donnell Torroba, Patricio Alfonso (NSRW) Mrabit, Khammar (NSRW)	338993
RAS9035	Establishment of National Capabilities for Response to a Radiological and Nuclear Emergency	9L	2005	Dey, Sujit (TCAP)	Dey, Sujit (TCAP)	Zombori, Peter (NS) O'Donnell Torroba, Patricio Alfonso (NSRW)	251900
RAS9036	Strengthening National Regulatory Infrastructure for the Control of Radiation Sources	9T 9C	2005	Dey, Sujit (TCAP)	Dey, Sujit (TCAP)	Djermouni, Belkacem (NSRW) O'Donnell Torroba, Patricio Alfonso (NSRW) Mrabit, Khammar (NSRW)	674600

RAS9037	Education and Training in Support of Radiation Protection Infrastructure	9X 9C	2005	Dey, Sujit (TCAP)	Dey, Sujit (TCAP)	Sadagopan, Geetha (NSRW) O'Donnell Torroba, Patricio Alfonso (NSRW) Mrabit, Khammar (NSRW)	992933
RER4028	Repatriation, Management and Disposition of Fresh and/or Spent Nuclear Fuel from Research Reactors	4B	2005	Atger, Arnaud (TCEU)	Atger, Arnaud (TCEU)	Adelfang, Pablo (NEFW)	8949388

Completed Regional/Interregional Projects (49)

<i>Project Number</i>	<i>Title</i>	<i>Field</i>	<i>Completed on</i>	<i>Country Officer</i>	<i>Project Responsible Officer</i>	<i>Technical Officer</i>	<i>Total Budget</i>
RAS5020	Food Irradiation Process Control and Acceptance (RCA)	5H	1996-05-13	Easey, John Frederick (TCPM)		Loaharanu, Paisan (NAFA)	523847
INT9144	Upgrading Waste Management Infrastructure	4O	1997-09-27	Barretto de Campos, Paulo Marcos (TCPB)		Bergman, Curt (NEPF)	174031
RAS8071	Isotopes & Rad. for Tech. & Environ. Sustainable Devp. (RCA)	8H 8J	1998-04-17	Aleta, Carlito Ronguillo (TCPA)		Thereska, Jovan (NAPC) Gueven, Olgun (NAPC) Walsh, Michael A.R. (NAPC)	2549371
RAS5021	Increasing the Capabilities of Common Grain Legumes (RCA)	5B 5C	1998-05-07	Aleta, Carlito Ronguillo (TCPA)		Serraj, Rachid (NAFA)	918530
RAS7003	Radiation Sterilization of Tissue Grafts (RCA)	7E	1998-08-28	Aleta, Carlito Ronguillo (TCPA)		Tatsuzaki, Hideo (NAHU)	1050580
RAS4011	Research Reactor Utilization (RCA)	4B	1998-08-31	Aleta, Carlito Ronguillo (TCPA)		Dimic, Viktor (NAPC)	368146
RAS6022	Strengthening Nuclear Medicine in RCA Member States (RCA)	6B	1998-08-31	Aleta, Carlito Ronguillo (TCPA)		Padhy, Ajit Kumar (NAHU)	326653
RAS8068	Isotopes and Radiation in Industry and Environment (RCA)	8C 8J 8H 8E	1998-08-31	Aleta, Carlito Ronguillo (TCPA)		Thereska, Jovan (NAPC)	780874

RAS8070	Isotopes and Radiation in Industry and the Environment (RCA)	8C 8H 8G	1998-08-31	Aleta, Carlito Ronguillo (TCPA)		Thereska, Jovan (NAPC)	1006110
RAS0022	Public Acceptance and Trade in Irradiated Food (RCA)	0K 5H	1998-12-11	Aleta, Carlito Ronguillo (TCPA)		Loaharanu, Paisan (NAFA)	86048
RAS6018	Radioimmunoassay for Hepatitis B Diagnosis (RCA)	6B	1998-12-23	Aleta, Carlito Ronguillo (TCPA)		Ch'Ng, Soo Ling (NAHU)	922575
RAS0021	Nuclear Power Planning (RCA)	0A 0B 0J	1999-11-30	Aleta, Carlito Ronguillo (TCPA)		Mazour, Thomas Joseph (NENP)	165258
RAS0023	Energy, Electricity and Nuclear Power Planning (RCA)	0A 0B 0J	1999-12-21	Aleta, Carlito Ronguillo (TCPA)		Mazour, Thomas Joseph (NENP) Hamilton, Bruce (NE)	410427
RAS9006	Strengthening of Radiation Protection Infrastructures (RCA)	9C	1999-12-21	Aleta, Carlito Ronguillo (TCPA)		Oresegun, Modupe Olusola (NSRW) Mrabit, Khammar (NSRW)	1597518
INT9143	Upgrading Radiation Protection Infrastructure	9C	2000-12-08	Barretto de Campos, Paulo Marcos (TCPB)	Barretto de Campos, Paulo Marcos (TCPB)	Gonzalez, Abel Julio (NSRW) Mrabit, Khammar (NSRW)	5306472
RAS0024	Project Formulation Meetings (RCA)	0B	2001-05-31	Aleta, Carlito Ronguillo (TCPA)	Aleta, Carlito Ronguillo (TCPA)	Aleta, Carlito Ronguillo (TCPA)	384759
RAS5034	Irradiation As Sanitary & Phytosanitary Food Treatment (RCA)	5H	2001-08-27	Aleta, Carlito Ronguillo (TCPA)	Aleta, Carlito Ronguillo (TCPA)	Loaharanu, Paisan (NAFA)	175852
RAS4019	Improving Research Reactor Operation and Utilization (RCA)	4B	2001-09-13	Aleta, Carlito Ronguillo (TCPA)	Aleta, Carlito Ronguillo (TCPA)	Basu, Saibal (NAPC)	192778
RAS8078	Nucleonic Control Systems and Tracers in Industry (RCA)	8C	2002-05-31	Aleta, Carlito Ronguillo (TCPA)	Aleta, Carlito Ronguillo (TCPA)	Thereska, Jovan (NAPC)	391643
RAS8080	Better Mgt of Envir & Industry Thru Isotope & Rad Tech (RCA)	8A 7J 0J	2002-07-15	Aleta, Carlito Ronguillo (TCPA)	Aleta, Carlito Ronguillo (TCPA)	Turner, Jeffrey Vaughan Vaughan (NAPC)	811067
RAS8077	Thematic Programme on Advanced Techniques for Industry (RCA)	8C	2002-07-30	Aleta, Carlito Ronguillo (TCPA)	Aleta, Carlito Ronguillo (TCPA)	Einav, Isaac (NAPC)	364835
RAS0028	Comparative Assessmt of Electricity Generation Options (RCA)	0E	2003-01-30	Aleta, Carlito Ronguillo (TCPA)	Kim, Kyoung-Pyo (TCPA)	Bui, Duy Thanh (NE)	436979

RAS4016	Disposal of Radioactive Waste from Non-Power Sources (RCA)	4O	2003-01-30	Aleta, Carlito Ronguillo (TCPA)	Kim, Kyoung-Pyo (TCPA)	Dayal, Ramesh (NEFW)	156601
RAS8089	Optimization of Mineral Resources Recovery Using Low Radioactivity Portable Nucleonic Gauges (RCA)	8C	2003-01-30	Aleta, Carlito Ronguillo (TCPA)	Aleta, Carlito Ronguillo (TCPA)	Thereska, Jovan (NAPC)	312352
RAS0033	Role of Nuclear Power and Other Energy Options in Mitigating Greenhouse Gas Emissions (RCA)	0E	2003-02-26	Aleta, Carlito Ronguillo (TCPA)	Kim, Kyoung-Pyo (TCPA)	Bui, Duy Thanh (NE)	202399
RAS4020	Improvement of Research Reactor Operation and Utilization (RCA)	4B	2003-02-26	Aleta, Carlito Ronguillo (TCPA)	Kim, Kyoung-Pyo (TCPA)	Paranjpe, Shriniwas Krishnarao (NAPC)	238067
RAS8083	Management of Marine Coastal Environmental Pollution (RCA)	8G	2003-02-26	Aleta, Carlito Ronguillo (TCPA)	Aleta, Carlito Ronguillo (TCPA)	Fowler, Scott W. (NAML) Boisson, Florence (NAML) Turner, Jeffrey Vaughan Vaughan (NAPC)	201587
RAS8086	Radiotracers/Sealed Sources/Nucleonic Gauges in Indust.(RCA)	8J	2003-02-26	Aleta, Carlito Ronguillo (TCPA)	Aleta, Carlito Ronguillo (TCPA)	Thereska, Jovan (NAPC)	532451
RAS9021	Upgrading Radiation Protection Infrastructure	9C	2003-03-28	Dey, Sujit (TCAP)	Dey, Sujit (TCAP)	Mrabit, Khammar (NSRW) Bilbao Alfonso, Alejandro Victor (NSRW)	2418788
RAS7008	Quality Assurance in Radiation Sterilization of Tissue Graft (RCA)	7E	2003-04-29	Aleta, Carlito Ronguillo (TCPA)	Aleta, Carlito Ronguillo (TCPA)	Hendry, Jolyon Hindson (NAHU)	920506
RAS5029	Nuclear Techniques for the Promotion of Agroforestry Systems	5B	2003-05-30	Lutfi, Nabil (TCAP)	Lutfi, Nabil (TCAP)	Keerthisinghe, Deegala Gamini (NAFA)	390965
RAS0030	Design and Formulation of Project Proposals	0B	2003-06-25	Lutfi, Nabil (TCAP)	Lutfi, Nabil (TCAP)	Razley, Mohd. Nordin (TCPA)	667493
RAS7010	Measuring the Effectiveness of Multinutrient Supplementation	7J	2003-12-31	Lutfi, Nabil (TCAP)	Lutfi, Nabil (TCAP)	Iyengar, Govindaraja Venkatesha (NAHU)	475399
RAS0025	Technical Co-operation Among Developing Countries (RCA)	0A	2004-04-30	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	490260
RAS5037	Mutational Enhancement for Genetic Diversity in Rice (RCA)	5C	2004-04-30	Dias, Mahendra Prinath (TCAP)	Kim, Kyoung-Pyo (TCPA)	Shu, Qingyao (NAFA)	335110

RAS6035	LDR and HDR Brachytherapy in Treating Cervical Cancer (RCA)	6C	2004-04-30	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Vikram, Bhadrasain (NA) Shortt, Kenneth Robert (NAHU) Pernicka, Frantisek (NAHU)	241489
RAS8090	Upgrading Natural Polymers and Environment Conservation Through Radiation Processing (RCA)	8H	2004-04-30	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Chmielewski, Andrzej Grzegorz (NAPC)	75359
RAS0029	Radiation Protection and Networking (RCA)	0F	2004-05-20	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Sadagopan, Geetha (NSRW)	176735
RAS2009	Quality Assurance and Good Manufacturing Practice for Radiopharmaceuticals	2G	2004-05-20	Lutfi, Nabil (TCAP)	Lutfi, Nabil (TCAP)	Pillai, Maroor Raghavan Ambikalmajan (NAPC)	322754
RAS4017	Maintenance and Repair of Nuclear Instruments	4G	2004-05-20	Lutfi, Nabil (TCAP)	Lutfi, Nabil (TCAP)	Kaufmann, Herbert (NAPC)	596355
RAS6028	Nuclear Medicine Applications (RCA)	6B	2004-05-20	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Padhy, Ajit Kumar (NAHU) Solanki, Kishor K. (NAHU)	1932912
RAS6027	Quality Assurance in Radiation Therapy (RCA)	6C	2004-08-27	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Vikram, Bhadrasain (NA) Shortt, Kenneth Robert (NAHU) Pernicka, Frantisek (NAHU)	774115

RAS8076	Better Management of Environment and Industrial Growth - Joint UNDP/RCA (RCA)	8A	2004-08-27	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Yonezawa, Chushiro (NAHU) Boisson, Florence (NAML) Markowicz, Andrzej (NAAL) Pang, Zhonghe (NAPC) Kemppainen, Markku (TCPC) Chmielewski, Andrzej Grzegorz (NAPC) Jin, Joon-Ha (NAPC)	1045640
RAS8082	Isotopic and Related Techniques to Assess Air Pollution - Joint UNDP/RCA (RCA)	8G	2004-08-27	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Markowicz, Andrzej (NAAL) Yonezawa, Chushiro (NAHU)	573112
RAS9018	Harmonization of Radiation Protection (RCA)	9C	2004-10-29	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Djermouni, Belkacem (NSRW) Mrabit, Khammar (NSRW)	1805756
RAS7012	Diagnosing Osteoporosis Using Nuclear Techniques (RCA)	7J	2004-12-30	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Mokhtar, Najat (NAHU)	29106
RAS2010	Quality Assurance and Quality Control of Nuclear Analytical Techniques	2C	2005-02-28	Lutfi, Nabil (TCAP)	Lutfi, Nabil (TCAP)	Roszbach, Matthias H. (NAPC)	420013
RAS8085	Non-Destructive Testing and Evaluation (RCA)	8C	2005-06-30	Dias, Mahendra Prinath (TCAP)	Dias, Mahendra Prinath (TCAP)	Einav, Isaac (NAPC)	229418
RAS6032	Regional Screening Network for Neonatal Hypothyroidism	6B	2005-12-28	Kamel, Reyad Sherif (TCAP)	Kamel, Reyad Sherif (TCAP)	Solanki, Kishor K. (NAHU)	619108

Cancelled Regional/Interregional Projects (2)

<i>Project Number</i>	<i>Title</i>	<i>Field</i>	<i>Cancelled On</i>	<i>Country Officer</i>	<i>Project Responsible Officer</i>	<i>Technical Officer</i>	<i>Total Budget</i>
RAS5036	Monitoring Pesticide Residues in Food & the Environment(RCA)	5G	2000-12-13	Aleta, Carlito Ronguillo (TCPA)		Ferris, Ian Glen (NAFA)	0

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